

Microscope program catches eye of students

Reported by Materials and Manufacturing directorate

WRIGHT-PATTERSON AFB, OHIO — “What’s the smallest thing you’ve ever seen? Anything students tell us about, we can top it. We can show them something smaller!”

That’s how Eric Pooler, a third-year engineering-physics major at Wright State University and research assistant at the Air Force Research Laboratory’s Materials and Manufacturing directorate here, describes a unique program at the directorate. This past school year’s program, once more, has placed area students at the controls of some of the world’s most powerful scanning electron microscopes.

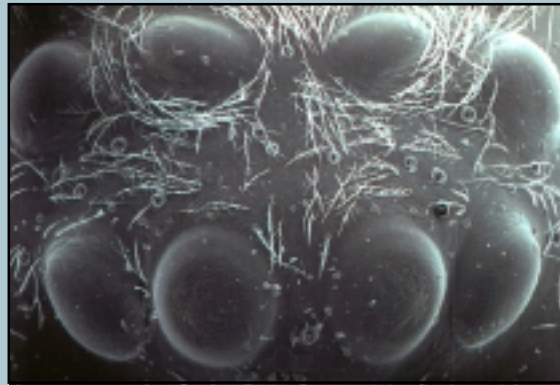
Initiated in 1990, the Scanning Electron Microscope Educators, or SEMEDS, program attracts up to 400 students annually, providing on-the-spot experience with a technology they previously could only read about. During this school year, 353 students from 18 schools around the Miami Valley have gone through the formal SEMEDS program; an additional 200 students received hands-on experience with the microscopes during special events and tours.

Both students and teachers gain real-world experience operating the “super” microscopes, capable of enlarging objects up to 200,000 times their normal size, Pooler said. They’re also given an opportunity to meet and interact with working scientists in a real-world laboratory setting.

“The microscopic world provides a different scale for looking at things,” Pooler said.

He should know; he participated in the program as a senior at Centerville High School in 1996, and currently serves as a SEMEDS volunteer instructor when he’s not assisting in laser experiments in the directorate’s new Ultrafast Physics Laboratory or attending classes.

When the students arrive, they are briefed on the directorate’s mission, introduced to the volunteer instructors for that session, then divided into groups and given hands-on experience operating the microscopes. The scanning electron microscopes enable them to explore a variety of interesting specimens, including bee stingers, computer chips, compact



SEEING THINGS – This is a close-up view of a spider’s eye as seen by students participating in the Scanning Electron Microscope Educators Program. The program is sponsored by the Materials and Manufacturing directorate of the Air Force Research Laboratory.

discs, coins, human hair and spiders, all of which take on mesmerizing characteristics at the higher magnifications.

“SEMEDS places science in front of students and provides something they can physically see and manipulate,” Pooler said. “It gives students an opportunity to use a sophisticated piece of equipment and to look at something that has genuine research value. The world is more than you see. There’s a lot going on; you just don’t see it.”

The SEMEDS program was created by Dr. Wade Adams, chief scientist of the directorate, and Dr. Al Jackson, a research scientist in the directorate’s Materials Process Design branch. The program is offered after duty hours, four times a month and is designed to accommodate 18 students a session.

Materials researchers like Pooler, working with the Wright-Patt Educational Outreach Office, have donated several thousands of hours of their own time during the past eight years working with the students. Their efforts have been applauded by the Dayton-area teachers and schools involved in the program and also have spawned several spin-off programs at local universities and scientific organizations, said Katie Thorp, an engineer in the directorate’s Nonmetallic Materials division and one of the SEMEDS program’s chief administrators.

“The SEMEDS program exposes the next generation to science and to engineers and scientists in their working

environment. It also provides role models and ideas to students who are nearing critical decision points about where they would like to go in life, their careers and education,” Thorp said.

“The program is for any student because exposure to research is the nature of how new ideas are brought about,” Pooler said. “SEMEDS is a perfect example of that. I think the individuals who organized the program have put a lot of work into it. They’re very dedicated to what they are doing.”

For more information on the SEMEDS program, contact Katie Thorp at (937) 255-1138; Marc Martin at (937) 255-3808, ext. 3166; or Suzanne Bertke at the Educational Outreach Office at (937) 253-7125. @



THE HANDS-ON APPROACH — During the last school year 353 students from 18 schools around Miami Valley, Ohio, experienced the SEMEDS program. Two hundred other students got their chance to use the microscopes during special events and tours at the Materials and Manufacturing directorate.